



Riverton Laboratory
29 Country Acres Rd., Riverton, WY 82501
(307) 856-0866 • www.spl-inc.com

CASE NARRATIVE

Client: Caerus Oil and Gas
Project: Caerus BIG SDS Sampling Project

Lab Order: 20030513
Report Date: 3/25/2020

This data package consists of the following:

Case Narrative - 1 Page
Sample Analysis Reports - 6 Pages
Qualifier Data- 1 Page
Login & COC- 2 Pages

Some parameters were subcontracted out to Pace Analytical.

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Laboratory Analytical Report

Customer Name: Caerus Order ID: 20030513
Project ID: Caerus BIG SDS Sampling Project Report Date: 3/25/2020

Lab Sample ID: 20030513-01 Date: Time:
Customer Sample ID: Middle Fork Collection: 3/3/2020 2:33 PM
Matrix: Aqueous Received: 3/5/2020 2:24 PM

Notes:

Analyses	Result	Units	RL	Qual.	Method	Analysis Date/Time	Analyst
Appearance	Clear w/ small black particulates				Visual	3/23/2020 12:30:00 PM	JS
Arsenic	ND	mg/L	0.5		EPA 6010 C	3/10/2020 9:47:07 PM	RH
Barium, Total	27.3	mg/L	0.5		EPA 6010 C	3/10/2020 9:47:07 PM	RH
Cadmium	ND	mg/L	0.5		EPA 6010 C	3/10/2020 9:47:07 PM	RH
Chloride	6271	mg/L	100		EPA 300.0	3/23/2020 1:41:00 PM	TMC
Apparent Color (Unfiltered)	150	pcu			SM 2120 B	3/23/2020 12:15:00 PM	JS
True Color (Filtered)	60	pcu			SM 2120 B	3/23/2020 12:15:00 PM	JS
Visual	Clear w/ particulates				SM 2120 B	3/23/2020 12:15:00 PM	JS
Flash Point	122.0	°F	0		SW 1010	3/23/2020 2:30:00 PM	SDF
Lead	ND	mg/L	0.5		EPA 6010 C	3/10/2020 9:47:07 PM	RH
Nickel	ND	mg/L	0.5		EPA 200.7	3/10/2020 9:47:07 PM	RH
Odor	Faint Hydrocarbon				Olfactory	3/23/2020 12:40:00 PM	JS
pH	6.98	s.u.	0.01		EPA 150.1	3/23/2020 3:10:00 PM	JS
Physical State	Liquid				Visual	3/23/2020 12:30:00 PM	JS
Silver	ND	mg/L	0.5		EPA 6010 C	3/10/2020 9:47:07 PM	RH
Specific Gravity	1.009	g/cc	0.001		ASTM D 1429-03	3/23/2020 12:45:00 PM	JS
Sulfide	0.27	mg/L	0.01	H,M	SM 4500-S2- D	3/10/2020 10:00:00 AM	TMC
Zinc	ND	mg/L	0.5		EPA 200.7	3/10/2020 9:47:07 PM	RH

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Definitions:

ND-Not Detected at the reporting limit

S-Spike Recovery outside accepted recovery limits

D-Diluted out of recovery limits

RL-Analyte Reporting Limit

J-Analyte detected below quantitation limits

L-Analyzed by a contract laboratory

H-Holding times for preparation or analysis exceeded

M-Matrix Effect

Documentation will be kept for five (5) years.

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LABORATORY ANALYTICAL REPORT

Customer Name: Caerus

Order ID: 20030513

Project ID: Caerus BIG SDS Sampling Project

Report Date: 3/25/2020

Lab ID: 20030513-01

Date Time

Customer Sample ID: Middle Fork

Collection 3/3/2020 2:33 PM

Matrix: Aqueous

Received: 3/5/2020 2:24 PM

Notes:

Analyses	Result	Units	RL	Qual.	Method	Analysis Date/Time	Analyst
Organic Compounds							
Benzene	19300	ug/L	100		EPA 8021 B	3/11/2020 4:02	TMC
Surr: 4-Bromofluorobenzene	114.3	%	70-130		EPA 8021 B		
Toluene	29110	ug/L	100		EPA 8021 B	3/11/2020 4:02	TMC
Surr: 4-Bromofluorobenzene	114.3	%	70-130		EPA 8021 B		
Ethyl Benzene	541.6	ug/L	100		EPA 8021 B	3/11/2020 4:02	TMC
Surr: 4-Bromofluorobenzene	114.3	%	70-130		EPA 8021 B		
m,p-Xylene	10970	ug/L	200		EPA 8021 B	3/11/2020 4:02	TMC
Surr: 4-Bromofluorobenzene	114.3	%	70-130		EPA 8021 B		
o Xylene	2043	ug/L	100		EPA 8021 B	3/11/2020 4:02	TMC
Surr: 4-Bromofluorobenzene	114.3	%	70-130		EPA 8021 B		

Definitions:

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ANALYTICAL RESULTS

Project: 20030513

Pace Project No.: 10511176

Sample: 20030513-01		Lab ID: 10511176001		Collected: 03/03/20 14:33		Received: 03/10/20 09:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP, TCLP		Analytical Method: EPA 6010C Preparation Method: EPA 3010A Leachate Method/Date: EPA 1311; 03/12/20 10:04							
Selenium	<0.10	mg/L	0.10	1	03/12/20 11:30	03/13/20 13:22	7782-49-2		
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3010A							
Chromium	<10.0	ug/L	10.0	1	03/11/20 06:20	03/11/20 16:11	7440-47-3		
7470A Mercury, TCLP		Analytical Method: EPA 7470A Preparation Method: EPA 7470A Leachate Method/Date: EPA 1311; 03/12/20 10:04							
Mercury	<0.60	ug/L	0.60	1	03/12/20 14:25	03/16/20 14:04	7439-97-6		
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	<0.010	mg/L	0.010	1		03/18/20 10:22			
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	0.014	mg/L	0.010	1		03/10/20 19:51			FS,H3

REPORT OF LABORATORY ANALYSIS

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Date: 03/18/2020 06:51 PM

QUALIFIERS

Project: 20030513

Pace Project No.: 10511176

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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Login Report

Customer Name: Caerus

Order ID: 20030513

Project ID: Caerus BIG SDS Sampling Project

Order Date: 3/5/2020

Comment: 3/5/20- Sample rec'd out of hold for Sulfide. Ok to run past hold as per DM, verified by AC. TT

SAMPLE CONDITION RECORD

Number of cooler/packages received:	1
Number of bottles received:	10
Were the samples received intact? (no broken bottles, leaks, etc.)	Yes
Were the samples received with custody seals?	No
Were custody seals intact?	N/A
Did signature match?	N/A
Is the COC properly completed, legible, and signed?	Yes
Were all samples received accounted for on the COC?	Yes
Were all requested analyses understood and appropriate?	Yes
Did the bottle labels correspond with the COC information?	Yes
Were Samples collected in proper containers?	Yes
Were the Temp and Pressure recorded for cylinders?	N/A
Were all containers properly preserved, and pH checked - should be ≤ 2 ?	N/A
Do VOA vials have < 6 mm headspace?	N/A
Was a trip blank present?	No
Were all analyses within holding time at time of receipt?	No
Have rush or project due dates been checked and accepted?	Yes
Login verification: Client Name:	Yes
Login verification: Project Name:	Yes
Login Verification: Matrix:	Yes
Sample/Cooler Temperature(s):	10.2
Were cylinder valves leaking?	N/A
Were pressurized liquid samples collected at a rate of < 50 ml/min?	N/A

temp: 10.2

electronic format. Please contact one of our offices above for the form to be e-mailed to you.